



FLUOROELASTOMER (FPM), OIL RESISTANT ROTATING SHAFT OIL SEAL

WSP-M2D455-A/A2

1. SCOPE

The material defined by this specification is a fluoroelastomer (FPM) compound having good compression set and tear resistance.

2. APPLICATION

This specification was released originally for material used for the sealing element of a bonded rubber-to-metal seal used in transmission radial shaft seal applications. The material is capable of withstanding a -40 to 160 °C temperature range in a dynamic oil splashed environment.

3. REQUIREMENTS

3.0 STANDARD REQUIREMENTS FOR PRODUCTION MATERIALS

Material suppliers and part producers must conform to the Company's Standard Requirements For Production Materials (WSS-M99P1111-A).

3.4 SLAB STOCK

3.4.1 Preparation of Test Specimens

All tests are to be performed on specimens die-cut from molded test sheets manufactured from the same material and with equivalent cure to production parts. The test sheets shall have the following dimensions:

150 x 150 mm, min x 2.0 +/- 0.2 mm

		A	A2
3.4.2	Density, +/- .02 g/cm ³ (ISO 1183, Method A/ASTM D 297)	2.02	1.92
3.4.3	Hardness, International (ISO 48/ASTM D 1415)	67 - 75	81 - 89
3.4.4	Hardness, Durometer A (ISO 868/ASTM D 2240, instantaneous, plied-up specimen. Hand held durometers shall not be used)	72 - 78	82 - 88
3.4.5	Tensile Strength, MPa, min (ISO 37/ASTM D 412, Die C)	13.5	8.5
3.4.6	Elongation at Break, %, min (Test Method according to para 3.4.5)	220	135

Date	Action	Revisions
2004 09 30	Revised	Inserted 3.0; Deleted 3.1, 3.2, 3.3, 3.12 & 4
1997 02 13	Revised	Revised 3.4.2, 3.5.1, 3.6.1, 3.8.4
1991 03 01	Released	NT00E10077193054



Documents

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ENGINEERING MATERIAL SPECIFICATION

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		A	A2
3.4.7	Modulus at 100%, MPa, Elongation (Test Method according to para 3.4.5)	6.0	6.0
3.4.8	Tear Strength, kN/m, min (ISO 34, Method B, Procedure A/ ASTM D 624, Die C)	20	20
3.4.9	Brittleness Point, /°C, min (ISO 812, Type B specimen/ ASTM D 2137, Method A)	-17	-10
3.4.10	Ozone Resistance, max (FLTM BP 101-01, Procedure A)	Rating 0	Rating 0
3.4.11	Compression Set, %, max (ISO 815/ASTM D 395, Method B, except 25% compression, plied-up Type 1 specimens, 168 h at 165 +/- 2 °C)	40	40
3.5	HEAT AGED (ISO 188/ASTM D 573, 150 +/- 50 air changes/h, 168 h at 165 +/- 2 °C)		
3.5.1	Hardness Change	+/- 4	+/- 4
3.5.2	Tensile Strength Change, %	0 to +20	-10 to +20
3.5.3	Elongation Change, %	+/- 20	-25 to +15
3.5.4	Visual Evaluation		
	No surface tackiness or cracks when folded flat against itself.		
3.6	HEAT AGED (ISO 188/ASTM D 573, 150 +/- 50 air changes/h, 1000 h at 165 +/- 2 °C)		
3.6.1	Hardness Change	+/- 4	0 to + 6
3.6.2	Tensile Strength Change, %, max	+25	+50
3.6.3	Elongation Change, %, max	-25	-50
3.6.4	Visual Evaluation		
	No surface tackiness or cracks when folded flat against itself.		